The principal forms are as follows.

A. Rich ochreous ground colour, usual marking in red.

B. Rich ochreous ground colour, usual markings in dark brown.

C. Dark smoky brown markings much obscured.

D. Pale reddish, markings nearly obsolete.

E. Dark red, usual markings in darker red.

F. Dark reddish brown ground colour, area between outer margin and submarginal line pale, giving insect a pale outer band.

G. Dark reddish brown as above but central fascia darkest part of wing forming a dark band.

A percentage of the larvae taken proved to be parasitised and I sent a few of the flies bred to Mr. K. G. Blair who has kindly informed me that "two species are present, *i.e.*, *Orthostigma pumila*, Nees and *Aspilota insidiatrix*, Marsham, and that both these species are recognised as diptera parasites and it is suggested that they may have been introduced into the breeding cages with diptera larvae which were feeding in the leaves of the *Senecio*, but while I cannot be dogmatic, I am confident from all the circumstances that this was not so and that they came from the *peltigera* larvae and pupae, quite possibly however as super parasites, although I bred no other species of parasite.

A Structural Character of the Larval Cuticle and its possible bearing on the Classification of the Noctuidae.

By E. A. COCKAYNE, D.M., F.R.C.P., F.E.S.

Many years ago I noticed a peculiarity of structure common to the larvae of *Chloridea peltigera* and *Pyrrhia umbra* and was surprised to find that, while some authors placed them in the same or neighbouring genera, others put them into different sub-families. Recently I became interested in the matter again and examined the larvae of a number of species, some in my own collection and, by the kindness of Mr. Tams, others in the British Museum. The following is a description of the structural character to which I refer. The skin of the dorsal and lateral surfaces of the larva is more or less thickly covered with minute circular plates raised in the centre and smooth or culminating in a short sharp point. Interspersed amongst these are others usually fewer in number but larger and more perfectly developed so as to form cuticular spines, broad at the base, flattened or compressed laterally and curved backwards resembling a shark's tooth in shape. In the larvae of some species there is great variation in the size and length of the spines; some arise from a small base and are short, others arise from a large base and some of these have a much longer and finer tip than others, while in other species there is greater uniformity. In the different species there are differences in the number and to some extent in the size and shape of the spines. In *Heliothis* for instance they are very numerous and the majority are long and pointed and arise from a small base, while in *Chloridea* they arise from a larger base and are shorter and more sparsely set. In some species they are all brown or blackish, but in others they vary in colour matching the surrounding skin and may be pink, yellow, white or black. However much they vary in detail they are laterally compressed and curved in

all the species in which I have found them. They are seen most clearly with a magnification of about 40.

They are present in *Heliothis imperialis*, Stgr., *H. purpurascens*, Tausch. (in both species they are numerous, long and slender with a long fine point), *Rhodocleptria incarnata*, Freyer. (rather sparse and short), *Chloridea dipsacea*, L., *C. peltigera*, Schiff., *C. armigera*, Hübn. (numerous and rather short), *C. virescens*, Fabr. (small), *Chariclea delphini*, L. (sparse and both short and long), *Melicleptria scutosa*, Schiff. (many spineless small plates with relatively few larger ones with short spines), and no doubt they occur in other allied genera and species. They are absent in all the other noctuid larvae I have examined including *Actinotia radiosa*, Esp., *A. polyodon*, Clerck. (*perspicillaris*), and *A. conjuncta*, Püngl. with the exception of *Pyrrhia umbra*, in which they are rather numerous and of all sizes and shapes, though the pointed tip is generally short.

The character is so unusual and so similar in all the larvae possessing it that I think it is a real indication of close affinity. It is unlikely to have arisen independently by mutation in two different sub-families and equally unlikely to be a primitive character that has been lost by the majority of noctuid larvae. Support is lent to the view that it is a sign of relationship by the fact that in other structural characters the larvae of the *Heliothis* group are like that of *Pyrrhia umbra*, and they also resemble the larva of that species in their fondness for the flowers rather than the leaves of plants as food. The structure and the unusual range of colour variation through various shades of green, pink, and brown is very much the same in the larvae of *Chloridea dipsacea* and *Pyrrhia umbra* and to a less extent in *C. peltigera*. The general shape of the wings and the facies of some of the *Heliothis* group is also very like that of *Pyrrhia*.

Newman places *dipsacea*, *peltigera*, *armigera*, *scutosa*, and *umbra* (*marginatus*) all in the genus *Heliothis*, while both Kirby and Barrett put the genus *Chariclea* comprising *delphini* (*delphinii*) and *umbra* (*marginata*) next to *Heliothis* comprising *dipsacea*, *peltigera*, *armigera*, and *scutosa*, which seems to me a much more natural arrangement than that adopted by later authors, though *umbra* should have been placed in a different genus from any of the others. Warren in Seitz Palaearctic *Noctuidae* follows Staudinger and places *Pyrrhia umbra* in one sub-family and *Chloridea*, which includes *dipsacea*, *armigera*, and *peltigera*, and *Melicleptria*, which includes *scutosa*, in another.

Hampson in his " Catalogue of the Lepidoptera Phalaenae " places *Heliothis*, *Rhodocleptria*, *Chloridea*, *Chariclea*, and *Melicleptria* in the *Agrotinae* and *Pyrrhia* in the *Acronyctinae* or *Zenobianae* as they are now called. He puts the *Heliothis* group of genera at the highest point of one branch of the *Agrotinae*, but *Melicleptria* is placed on another branch and on both branches are genera with spineless larvae. This however is comparatively unimportant, and, if I am right, it only necessitates a little rearrangement within one part of the *Agrotinae*.

The really important matter is the relegation of *Pyrrhia* to the *Zenobianae*. One of the main points of differential diagnosis between the *Agrotinae* and the *Zenobianae* is that in the former the tibiae are more or less spinose and in the latter are without spines. The eyes are naked in both and the differences in neuration are probably of secondary importance. I think it is far more likely that *Pyrrhia*

has lost the tibial spines in its imago than that it has acquired the very remarkable cuticular spines in its larva, which are so similar to those of the *Heliothis* group. If so one of the fundamental distinctions between two of the main divisions of the *Noctuidae* is valueless, and it may well prove that some genera of *Agrotinae* really belong to the *Zenobianae* or of the *Zenobianae* to the *Agrotinae*.

Sark Lepidoptera.

By L. HUGH NEWMAN.

It has been the privilege of the writer to spend a season at Sark, collecting the butterflies of this Island, for the Lord Rothschild collection.

The only guide I had, as to the species to expect, was from an essay written by a Mr. Luff, in one of the publications of the Natural History Society of Guernsey. He published these observations over fifty years ago, and it is an interesting fact that all but three of the species he mentioned as being found in Sark were captured this year; this was out of a total of twenty-eight species.

I was able to report to Miss Edith Carey, an active member of the Society, two new species, viz.: *Papilio podalirius* and *Melitaea aurinia*. The three butterflies not seen, that were recorded as natives or usual migrants to the Island, were *Polygonia* (*Vanessa*) *c-album*, *Argynnis lathonia*, and *Colias hyale*.

Before giving a description of some of the more interesting forms met with during the sojourn, a complete list of butterfiies seen or captured during the season, with the dates of their first appearance, would, I think, be of general interest.

April 23rd. *Pararge aegeria*;
,, 27th. *Aglais urticae*;
,, 28th. *Pieris brassicae*;
,, 29th. *P. napi*;
,, 30th. *Callophrys rubi*;
May 1st. *Gonepteryx rhamni*, *Lycaenopsis argiolus*;
,, 2nd. *Vanessa io*;
,, 3rd. *Rumicia phlaeas*;
,, 5th. *Pararge megera*;
,, 9th. *Pieris rapae*;
,, 17th. *Coenonympha pamphilus*;
,, 22nd. *Pyrameis cardui*;
,, 25th. *Pyrameis atalanta*, *Melitaea cinxia*, *Aricia medon*;
,, 29th. *Polyommatus icarus*;
,, 31st. *Lampides boeticus*:
June 4th. Migration of *Pieris brassicae*; *Pieris rapae*; *Colias croceus*; *Pyrameis atalanta*, and *P. cardui*.
,, 6th. *Melitaea aurinia*;
,, 11th. *Pararge aegeria* (second brood);
,, 17th. *Papilio podalirius*;
,, 19th. *Plebeius aegon*;
,, 20th. *Epinephele jurtina*;
,, 25th. *Argynnis aglaia*;
,, 27th. *Hipparchia semele*;